
Bone Marrow Targeting of Hematopoietic Stem Cells Engineered to Overexpress 25-OH-VD₃ 1- α -hydroxylase for Acute Myeloid Leukemia Therapy

Grant Award Details

Bone Marrow Targeting of Hematopoietic Stem Cells Engineered to Overexpress 25-OH-VD₃ 1- α -hydroxylase for Acute Myeloid Leukemia Therapy

Grant Type: Inception - Discovery Stage Research Projects

Grant Number: DISC1-10620

Project Objective: This project explores the feasibility of treating acute myeloid leukemia with a combination of 1) 5-Azacytidine chemotherapy, which primes the bone marrow niche and 2) transplantation of autologous HSCs modified to express Vitamin D in the bone marrow niche, thereby promoting terminal differentiation of leukemic stem cells

Investigator:

Name:	David Baylink
Institution:	Loma Linda University
Type:	PI

Disease Focus: Acute Myeloid Leukemia, Blood Cancer

Award Value: \$178,967

Status: Pre-Active

Grant Application Details

Application Title: Bone Marrow Targeting of Hematopoietic Stem Cells Engineered to Overexpress 25-OH-VD₃ 1- α -hydroxylase for Acute Myeloid Leukemia Therapy

Public Abstract:**Research Objective**

We propose a new approach to differentiation therapy for acute myeloid leukemia by producing local level of high-dose vitamin D in bone marrow via cell therapy with engineered hematopoietic stem cells

Impact

If proven successful, the proposed research can serve as a major breakthrough in the treatment of multiple subtypes of AML and particularly important for improving survival in older patients.

Major Proposed Activities

- Evaluate homing and expansion of engineered hematopoietic stem cells in bone marrow of human leukemic xenograft (HLX) mice after precondition with 5-Azacytidine
- Optimize the number of injected hematopoietic stem cells without causing hypercalcemia
- Determine if the local concentration of vitamin D₃ is sufficient to differentiate leukemic blasts in bone marrow
- Determine the efficacy of combination therapy of 5-Azacytidine and cell therapy by measuring overall survival
- Determine the efficacy of combination therapy of 5-Azacytidine and cell therapy by measuring leukemia burden
- Monitor serum calcium level from peripheral blood during treatment period

Statement of Benefit to California:

Acute myeloid leukemia (AML) has poor outcome, especially in older, ailing patients who can't tolerate aggressive conventional chemotherapy. If proven successful, our work can serve as a major breakthrough in the treatment of multiple subtypes of AML and particularly important for improving survival in older patients. The State of California will be a leading authority in this field. Further, this work will benefit patients around the world, not limited citizens of California

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